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Improving the Competency of the Surveillance Rapid Response Team of Northeastern Thailand

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Abstract
This action research aimed to improve the competency of the surveillance rapid response team (SRRT) at a district level in Northeastern Thailand and involved four community hospitals, four District Health Offices (DHO) and eight Health centers. The process of action research improved the competency of the surveillance rapid response team by facilitating and enabling to identify, implement and evaluate a program of public health emergency improvements. Data were collected from two different sources: firstly a self-reflective questionnaire, and secondly focus groups and in-depth interviews with 50 local staffs. Improvements occurred in all skill domains, and the quantitative data supported the qualitative findings for all skill domains for which quantitative data was available. The surveillance rapid response team gained vital knowledge and worked in a more cooperative and proactive manner. The team became better supported by administrators. Action research was found to be a productive process for achieving valuable improvements in the competency of the staff, and represents a promising method for effective community change in general. These learning processes provided an alternative approach to improve the competency of the SRRT which will help to improve public health emergency responses in the future.
Keywords: Surveillance rapid response team, Competency, Action research

1. Introduction

In 2003, Severe Acute Respiratory Syndrome spread worldwide; an estimated 8,098 patients were infected, of whom 744 died. Since 2004, emerging diseases have become serious problems. In 2005, Thailand adopted a surveillance rapid response team (SRRT) at all levels to detect outbreaks of disease, and focus on immediate public health responses (Department of Disease Control 2005).

The response to public health emergencies needs improvement in Thailand. Academic and budgetary limitations exist for staff working on infectious disease outbreaks in developing countries (Wongba et al. 2010; Boulton et al.2003). Limited data from surveillance systems is utilized for prevention and control (Suttisa et al. 2007). The quality of surveillance information and disease investigation at these levels is limited (Thaewnongiew et al. 2009). The majority of health systems must improve their SRRT with respect to prevention and control, especially in the competencies of prompt response, investigation and analysis of surveillance information (Ramasut et al. 2006). Additionally, many epidemiologists have lower levels of competence in these nontraditional epidemiologic fields of knowledge, similar to other reports (Maureen et al. 2008). SRRTs often have no defined thresholds for action in response to surveillance data on epidemic-prone infectious diseases. The SRRTs need to improve reporting and investigation at a district level (Ditsoonun 2009).

The literature indicates that the competency of SRRTs needs to be improved in terms of leadership and methodical thinking, management and working skills, especially the ability to write investigation reports, as well as situation analysis and assessment to achieve a specific goal. Local government organizations have tried to solve these problems; however, significant funding would be required to train the SRRT in health facilities around Thailand, and these problems still remain (Wongba et al. 2010; Ramasut et al. 2006; Ditsoonun 2009). No studies have yet attempted to use an action research approach to improve the competency of the SRRT. Khungern (2004) used an action research approach to design, implement and evaluate quality improvements in a general hospital in Thailand. Action research focuses on power relationships and is designed to help people increase the value they attach to their experiences and discover their own solutions, rather than simply following others' directions.

Here, we used an action research approach to identify and solve problems related to the competency of the response to public health emergencies by the SRRT at a district level in one region of Thailand. As an essential component of the study, the researchers worked alongside the participants to gain a better understanding of the contexts in which

the SRRT worked and lived, their common experiences, and the constraints under which they worked, to enable the researchers to see how solving the issues which the participants raised could lead to a more competent SRRT. The researchers sought to empower the participating SRRT to address the system-related issues which they identified.

2. Materials and methods

This study used an action research design. Action research, a participative, collaborative process intended to solve practical problems and develop new knowledge together with the community, was conducted to encourage the SRRT members to solve their existing problems regarding the competency of their response to public health emergencies. Action research is a spiraling cycle of steps (situation analysis, planning, acting, and reflecting). During situation analysis, the study participants identified problems in collaboration with the researchers. In the planning phase, the participants developed action plans to achieve improvements. The plans were implemented and evaluated using self-evaluation. In the last step, the participants and researchers critically reflected on these evaluations. Two cycles were undertaken; the practice of reflection was encouraged throughout each step of both cycles. The researchers used self-reflection as a consciousness-raising strategy to help the participants achieve a better understanding of their situation and ways of overcoming difficulties (Kimmis & MeTaggart 2005).

2.1 Setting

Four community hospitals, four DHO and eight health centers located within the four Provinces of northeastern Thailand. In each case, the local administrator had consented to participation and agreed to support the study.

2.2. Data sources and participant recruitment

The participants recruited were involved in the SRRT, including the heads of the SRRT, core members of the SRRT, and SRRT members from each workplace who: (i) had at least one year of experience in the operational use of the SRRT, and (ii) consented to participate in the project. A final group of 50 participating SRRT members was selected by purposive sampling, according to the predetermined criteria relevant to the study.

2.3 Study approval

After receiving approval from the Ethics Committee of Khon Kaen Hospital, the researchers started to collect information in the field. All study participants signed a consent form. The study assessed the competency of the SRRT according to competencies for Applied Epidemiologists (CDC 2008).

2.4 Quantitative data

Information was collected through document review, and a self-administered questionnaire consisting of seven main aspects. Approximately five items were included per domain and scoring was performed conventionally (from good to poor).

2.5 Qualitative data

Qualitative data was gathered continuously over 12 months (March 2009 – April 2010), and the researchers facilitated the change process. Data were collected from six focus groups (10-12 study participants each), and from in-depth interviews with 20 participants. Focus group discussions were used to determine the goals for the project within the context of improving the competency of the SRRT, and later to discuss the findings of the action cycles. The interviews and focus group meetings lasted 60 to 80 minutes and were recorded. The researchers encouraged all participants to discuss, share experiences and find solutions together. The results of the first action cycle were used to plan the next cycle. Five meetings were held to help the participants create action plans and for evaluation after implementing the plans. Participant observation was also used to collect data throughout the fieldwork section of the study.

2.6 Quantitative data analysis

The competency of the SRRT was analyzed using numbers, percentages and 95% confidence intervals (CI). The mean change in the competency of the SRRT and 95% CI before and after the study were compared.

2.7 Qualitative data analysis

The researchers assessed the information obtained from the qualitative approach by content analysis (Elo & Kyngas 2008).

2.8 Trustworthiness

The trustworthiness of the study outcomes were assessed using Lincoln and Guba's guidelines (Lincoln & Guba 1985).

3. Result

3.1 Baseline characteristics

The study group contained 50 participants (23 males, 27 females); most were 23-50 years-old, hold a Bachelors

degree, and have 10-20 years working experience. The participants spend about 20% of their time on disease prevention and control; they are mainly engaged in routine work.

3.2 Improvements in the competency of the SRRT

After the study, the competencies to public health emergencies had improved in all skill domains; the quantitative data supported the qualitative findings for all skill domains for which quantitative data was available. The SRRT members gained vital knowledge and worked in more cooperatively and proactively. The participants gained more knowledge, and their improved understanding of the function of the SRRT team and the purpose of continuous supervision reduced their work distortion (Table 1).

3.3 Increased use of surveillance data in problem solving

Situation analysis skills increased during the study. The SRRT began to analyze data from the surveillance system to solve problems. They managed data for disease prevention and control, and recommend evidence-based interventions and control measures in response to epidemiologic findings. There was an adjustment in disease reporting behavior from just collecting Form 506 reports and passing them to the district, to solving local problems using this data. As one SRRT said "*Now, we analyze the data every month, we have to report to the village and, especially, the Sub-district Administrative organization (SAO) who would press for it when we are late. This is good because we are stimulated to pay more attention on our work"*

3.4 Increased knowledge of how to conduct the work appropriately

The majority of SRRT received additional training in epidemiology during the study. They knew how to apply this knowledge to their work in the field. Some participants also tried to acquire the necessary skills by themselves. The ability of the SRRT to write a report about an investigation improved to sufficient. Some participants had been of the impression that the investigation reports were important, but now they created the investigation reports because they were fully aware of the benefits of this process. As one SRRT said *"I received a phone call from the district tell me to investigate hand foot month diseases. I dare to say now that I have sufficient capability. I know how to the manage case, unlike in the past when I was not sure how to do this. I can now remember each step to do this. This is not only useful for me but also applicable to my work."*

3.5 Development of sufficient communication skills

Several areas in the four districts were amenable to integration, which led to better use of networking as a result. Most SRRT developed better networking skills. They communicated disease surveillance information from the local area to the district or other local areas to increase prevention and control. The SRRT in the local areas were able to detect abnormal occurrences or disease outbreaks and report them to the district. As one SRRT said, "During the outbreak of Vibrio cholera which occurred in another area, I hurriedly came back to our district to see if we had any patients. I send messages to the SRRT in the local area too. It is good to have our network. When someone detects a disease, they can let the other areas know quickly, so we can watch out in our area." The others agreed with this statement.

3.6 Improved experience of working in communities

The ability of the SRRT to work in the field improved considerably. Improvements were also detected in the ability of other persons, such as village health volunteers, to help detect newly infected patients in the community during a disease outbreak. In addition, the SRRT were able to provide information about the spread of an epidemic disease to the SAO or community. Moreover they participated in the development of community partnerships to support investigations.

3.7 Development of competency to comply with the local culture

The SRRT were found to be quite skillful in responding to the local culture. Most SRRT could communicate in the local dialect and communicate with the people in the villages very well. In case of an epidemic, they could interview patients and their relatives using the local dialect. SRRT understood the local way of life and customs, which will help to prevent the spread of disease. SRRT conducted investigations using the local languages and approaches tailored to the population under study. In addition, SRRT used their knowledge of specific socio-cultural factors for each population to interpret their findings.

3.8 Development of sufficient managerial skills

Most SRRT received more material support for undertaking epidemiology activities. All SRRT were supported by installation of an internet system for data transfer to develop the potential of the SRRT. More than 90% of the SRRT put epidemiology on the agenda of their monthly meetings, and used these meetings as a stage to share and learn about epidemiology procedures together. They included epidemiologic activities within the financial and operational plan of the Contracting Unit for Primary Care (CUP). Most SRRT received more material support for conducting

public health responses. As one SRRT stated: "Now, the training SRRT project has supported the development of a fiscally sound budget that would support the activities of the SRRT in the operational plan which is consistent with the finances of the CUP". The others agreed with this statement.

3.9 Increased leadership potential and development of systematic thinking

Leadership skills and systematic thinking ability also improved. The SRRT were prepared and ready to conduct their tasks in response to a public health emergency. The tasks of the SRRT increased substantially and they were promoted for that, especially team development in terms of capacity building and readiness for working in public health emergencies. The staffs were prepared for their work and were flexible enough to prevent the spread of diseases and control them. As one the SRRT said "We set up the project to implement performance measures for the SRRT and plan to take action to improve SRRT program performance in this year, and the CUP supports our project".

4. Discussion

The aims of the SRRT are to emphasize the surveillance of important infectious diseases and provide an immediate public health response. Rapid and effective disaster managements are crucial at all levels of the SRRT. However, differences among the individual SRRT, such as their educational background, prior training, work experience and ability, contribute significant challenges to the standardization of training and education. This study shows how operationally significant improvements can be achieved at this most basic level of competency. We used an action research approach to increase the competency of the SRRT in the local areas. This process involved a continuous spiral of cycles in which the SRRT engaged in a self-reflective learning process of identifying problems, exploring and deciding possible solutions, planning how to operationalize the remedial actions, implementing the potential improvements, assessing the results, and then beginning the cycle once again (Hart & Bond 1995). During the self-reflective learning process, the SRRT members became more aware of the importance of their work, and they took ownership of the problems and their lack of knowledge. They became self-motivated to act responsibly, and learned that their chances of success could be improved by sharing ideas and knowledge and collaborating with others (Al-Sheri *et al*. 1993).

In this study, improved competencies in the response to public health emergencies were conceptualized through action research. The study participants were stimulated to take action through self-reflective learning (Kimmis & MeTaggart 2005). The process of action research was used to identify strategies and plans which would enable the related organizations to work together to solve their problems and develop the competency of the SRRT. This differs from the approaches of other studies (Jiaviriyaboonya *et al*. 1999), where researchers developed plans to address certain issues, and then convinced the local staff to implement these pre-formulated plans. In this study, the participants working within the system applied their practical experiences and working relationships to identify problems, plan solutions and implement the necessary changes.

The involvement of all participants and their interactions stimulated a self-reflective learning process (Reason 2006). For example, before implementing the action plans, the researchers asked the participants to comment on the plans and discussed their responses with the participants. The participants' feedback improved the plans and their implementation. This level of involvement of all participants in every stage ensured that the participants experienced a sense of ownership of the action plans, which was critical to the participants' empowerment and the ultimate development of their competency. This outcome was similar to the study by Khungern (2010), which showed that when community changes are implemented by the community itself, there is more interest in making the planned changes successful.

When implementing the action plans, the participants acquired valuable experience in solving problems. When their plans sometimes did not work, they collaborated to find alternative solutions. Therefore, the participants became aware of their problems, and similarly to the opinion of Freire, started to see their problems and their importance, and understand the cause, relationships and factors linked to each problem. Identification of the important issues enabled the development and solving of the circumstances causing the problem (Freire 1974).

As part of the process, the SRRT members shared their experiences, views and knowledge in their own environment, learned from each other and increased their general level of awareness. Consciousness-raising became a result of the SRRT members increasing their awareness of their own situation (Wallerstein 1992). When the SRRT members experienced planning through group work and made independent decisions, they believed in their efforts, their self-confidence developed (Honey 1999), and they found they were able to implement their own action plans. At the outset, some SRRT members believed it was impossible to improve the competency of the SRRT and did not support the project. However, when the plans were being implemented, those who were initially skeptical became fully involved in the changes and supported them.

5. Conclusion

The SRRT is potentially useful for ensuring the detection of infectious disease outbreaks, monitoring responses and providing information for public health policy decisions. This study shows that the action research approach enables facilitators of change to work alongside those impacted by changes, and results in the added benefit of ensuring participant ownership - not only of the resulting changes, but also of the continuation of change and the introduction of further improvements after the action research facilitator has left the field. This study demonstrates that action research is a useful method for achieving effective community change within the public health working environment.

6. Acknowledgement

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5. Conclusion

A functional structure made up of holons is called holarchy. The holons, in coordination with the local environment, function as autonomous wholes in supra-ordination to their parts, while as dependent parts in subordination to their higher level controllers. When setting up the WOZIP, holonic attributes such as autonomy and cooperation must have been integrated into its relevant components. The computational scheme for WOZIP is novel as it makes use of several manufacturing parameters: utilisation, disturbance, and idleness. These variables were at first separately forecasted by means of exponential smoothing, and then conjointly formulated with two constant parameters, namely the number of machines and their maximum utilisation. As validated through mock-up data analysis, the practicability of WOZIP is encouraging and promising.

Suggested future works include developing a software package to facilitate the WOZIP data input and conversion processes, exploring the use of WOZIP in the other forms of labour-intensive manufacturing (e.g. flow-line production and work-cell assembly), and attaching a costing framework to determine the specific cost of each resource or to help minimise the aggregate cost of production.

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Table 1. Comparison of mean changes in the competency of the SRRT before and after action research

Skill Domain	Mean		95% CI of	P-value
	Before	After	mean1-mean 2	
- Analytic and assessment	25.45	32.13	7.45-5.91	0.001
- Basic public health knowledge	14.45	19.30	5.28-4.43	0.001
- Communication	12.09	15.44	3.72-2.97	0.001
- Community dimensions of practice	11.44	12.08	0.97-0.32	0.001
- Cultural competency	16.63	17.50	1.31-0.40	0.001
- Financial planning and management	6.18	11.33	5.53-4.78	0.001
- Leadership and systems thinking	11.18	11.67	0.86-0.12	0.001

After the study, the competencies to public health emergencies had improved in all skill domains.